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98. *Hypnum Patientiæ* Lindb. McCargoe's Cove.  
99. *Hypnum reptile* Mx. Park Place.  
100. *Plagiothecium denticulatum* (L.) B. & S. Bog forest, common; climax forest.  
101. *Plagiothecium turfaceum* Lindb. Same habitat as last.  
102. *Scorpidium scorpioides* (L.) Limpr. Sedge zone in bogs.

#### Neckeraceae

103. *Neckera oligocarpa* Bruch. "Forest road, Washington Harbor; woods." Holt.  
104. *Neckera pennata* (L.) Hedw. Climax forest, cliffs and boulders; sheltered shore rocks.

#### Leucodontaceae

105. *Leucodon sciurioides* (L.) Schwaegr. Boulders and cliffs in climax forest.

#### Fontinalaceae

106. *Dichelyma uncinatum* Mitt.? "Growing in a pool on small island at upper end of Rock Harbor." Holt.  
CARMEL, CALIFORNIA, May, 1912.

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### DITRICHUM RHYNCHOSTEGIUM KINDB.

In the BRYOLOGIST for November in the additions to the list of mosses of West Virginia published by Prof. Sheldon this species is listed from Cranberry Glades (3743). I have since had the privilege of examining these specimens and cannot see how they differ from *Ditrichum pallidum*. The original description<sup>1</sup> calls for a dioicous species, but the antheridia were found to be in clusters below the perichætium, therefore autoicous.

ELIZABETH G. BRITTON.

NEW YORK BOTANICAL GARDEN, December 4th, 1912.

<sup>1</sup> Revue Bryologique 37: 14. 1910.

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### PLAGIOTHECIUM GEOPHILUM (AUST.) GROUT

I have found this species at two stations in Ohio. First, I found it fruiting, with the capsules just beginning to cast their lids, Dec. 1 to 5, 1909, growing on clay and shales, on the steep sides of gullies and ravines in open deciduous woods in the neighborhood of Sulphur Lick Springs, Ross County. I cannot say how abundant it was, as it was my maiden collecting trip, and I adhered

strictly to my determination to collect only fruiting specimens, and did not recognize any of the mosses at the time I collected them. Second, I find it here, in "Hills and Dales," just outside of the city limits of Dayton, sparsely scattered over a very limited area, growing on clay and limestone, on the steep sides of gullies and banks of brooks, in open deciduous woods. All I have found here has been within a tract less than one-half mile square, all sterile.

Sulphur Lick Springs, is about fifty miles southeast of Dayton, and about nine miles west of Chillicothe. Both stations present about the same physical conditions. Dayton station is about nine hundred feet above sea level, while the country around Sulphur Lick Springs ranges between one thousand and twelve hundred feet above the sea. Both are in the same geologic horizon, the Upper Silurian, and both are covered with heavy deposits of glacial drift, and with the same type of forest growth.

H. S. JEWETT, M.D.

DAYTON, Ohio,

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## REVIEWS

### INTER-RELATIONSHIPS OF THE BRYOPHYTA

BY DR. FRANK CAVERS

Some months ago the Editor received a complimentary copy of the above pamphlet for review, but a desire for a more complete and thorough examination of the work has delayed the matter until an apology is due Dr. Cavers.

The pamphlet of 210 pp., 6"x9¾", illustrated by 72 figures in the text is a thoughtful and suggestive contribution to the subject indicated by its title. With some exceptions the classification adopted in the *Pflanzenfamilien* of Engler and Prantl are followed.

The *Hepaticæ* including the *Anthocerotales* occupy 151 pages, making a pretty complete survey of that subdivision of the "Bryophyta." Because of their great variety of structure and the perplexing nature of their relationships, 65 pages are given to the comparatively small groups *Sphaerocarpaceles* and *Marchantiales*.

Dr. Cavers does not accept Howe's view that the *Anthocerotales* are worthy of being elevated to the rank of a class co-ordinate with *Hepaticæ* and disposes of the main distinction on which Howe bases his view, *i. e.* "(i) A single large chloroplast to each cell, instead of several smaller chloroplasts as in the assimilative tissues of the *Hepaticæ* proper; (ii) the antheridia arise within the thallus—are endogenous in origin—and the walls of the immersed archegonia are confluent with the adjacent tissues; (iii) the presence of meristematic tissue in the capsule near its base, by the activity of which the capsule has a long continued growth, ripening spores towards its apex while forming new spore-mother-cells below; (iv) the presence, in probably all cases, of a columella around which the